P[illegible]NT COOPERATION TREA[illegible]

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Commissioner
US Department of Commerce
United States Patent and Trademark
Office, PCT
2011 South Clark Place Room
CP2/5C24
Arlington, VA 22202
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 08 November 2000 (08.11.00)	
International application No. PCT/US00/06682	**Applicant's or agent's file reference** X12652
International filing date (day/month/year) 22 March 2000 (22.03.00)	**Priority date** (day/month/year) 02 April 1999 (02.04.99)
Applicant SU, Eric, Wen et al	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International Preliminary Examining Authority on:

13 October 2000 (13.10.00)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland**	Authorized officer Henrik Nyberg
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	**FOR FURTHER ACTION**	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
X12652		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US 00/06682	22/03/2000	02/04/1999
Applicant		
ELI LILLY AND COMPANY et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 7 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language,** the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   [ ] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

   b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

   [X] contained in the international application in written form.

   [ ] filed together with the international application in computer readable form.

   [ ] furnished subsequently to this Authority in written form.

   [X] furnished subsequently to this Authority in computer readble form.

   [X] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   [X] the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. [X] **Certain claims were found unsearchable** (See Box I).

3. [X] **Unity of invention is lacking** (see Box II).

4. With regard to the **title,**

   [ ] the text is approved as submitted by the applicant.

   [X] the text has been established by this Authority to read as follows:

   HUMAN OBESITY PROTEIN BINDING PROTREIN-2 HOMOLOG AND USES THEREOF

5. With regard to the **abstract,**

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. _____

   [ ] as suggested by the applicant.

   [ ] because the applicant failed to suggest a figure.

   [ ] because this figure better characterizes the invention.

   [ ] None of the figures.

09/937626 (30 PCT 11/02/01

14

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
X12652		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US00/06682	22/03/2000	02/04/1999
International Patent Classification (IPC) or national classification and IPC C07K14/715		
Applicant ELI LILLY AND COMPANY et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☒ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
13/10/2000	03.07.2001
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer SCHEFFZYK, I Telephone No. +49 89 2399 8602

Form PCT/IPEA/409 (cover sheet) (January 1994)

SECTION V----------

Novelty of present claims can be acknowledged since a nucleic acid sequence encoding at least 90% of the contiguous amino acid sequence shown in SEQ.ID.NO. 3 is not taught in the available prior art. Moreover, the presence of an inventive step also can be acknowledged since the existence of such a sequence was not derivable from the documents cited in ISR. Thus, present claims meet the requirements of Art. 33(2)(3) PCT.

SECTION VI----------

Hillier L. et al. EMBL Database Accession no.AI880327
Birren B. et al., EMBL Database Accession No. AC021676

SECTION VII----------

1). Claim 3 does not comply with the requirements of Art. 34(2)(b) PCT since the application as originally filed does not teach a complementary sequence of the sequence claimed in claim 2.

2). The serial numbers should be replaced by the corresponding publication numbers.

3). Concerning the term "incorporated by reference" applicant's attention is drawn to Guidelines C-II 4.4 and 4.17 PCT.

SECTION VIII----------

1). Claims 15 and 19 relate to subject-matter considered by this Authority to be covered by the provisions of Rule 67.1(iv) PCT. Consequently, no opinion will be formulated with respect to the industrial applicability of the subject-matter of these claims (Article 34(4)(a)(i) PCT). Moreover, these claims and claim 20 also are objected to under Art. 5 and 6 PCT since the application as filed does not show that the claimed polypeptide is actually suitable for the claimed purpose.

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-21
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-21
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-14, 16-18,20,21
	No:	Claims	15,19: see section VIII

2. Citations and explanations
see separate sheet

VI. Certain documents cited

1. Certain published documents (Rule 70.10)

and / or

2. Non-written disclosures (Rule 70.9)

see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/US00/06682

I. Basis of th r p rt

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:
Description, pages:

1-75 as originally filed

Claims, No.:

1-21 with telefax of 11/06/2001

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

To:

Robert L. Sharp
ELI LILLY AND COMPANY
Lilly Corporate Center
Indianapolis, Indiana 46285
ETATS-UNIS D'AMERIQUE

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Rule 71.1)

Date of mailing *(day/month/year)*	03.07.2001
Applicant's or agent's file reference X12652	**IMPORTANT NOTIFICATION**

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US00/06682	22/03/2000	02/04/1999

Applicant
ELI LILLY AND COMPANY et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/	Authorized officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	CLEERE, C Tel.+49 89 2399-8061

Form PCT/IPEA/416 (July 1992)

INTERNATION EARCH REPORT

International application No.
PCT/US 00/06682

Box I Obs rvati ns where certain claims wer f und unsearchable (Continuati n of it m 1 f first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. [X] Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

Although claims 23 and 27 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.

2. [X] Claims Nos.: 11,19,23(searched incompletely)
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

see FURTHER INFORMATION sheet PCT/ISA/210

3. [ ] Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

B x II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. [X] As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. [ ] As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. [ ] As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. [ ] No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

[ ] The additional search fees were accompanied by the applicant's protest.

[X] No protest accompanied the payment of additional search fees.

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
P,X	HILLIER L. ET AL.: "WashU-NCI human EST Project; ap33a07.x1 Schiller astrocytoma Homo sapiens cDNA clone IMAGE:1957140 3' similar to TR:O43700 O43700 CD33L2.; mRNA sequence" EMBL DATABASE ENTRY AI880327; ACCESSION NO. AI880327, 22 July 1999 (1999-07-22), XP002156744	1,4-8, 15,20,26
P,X	BIRREN B. ET AL.: "Homo sapiens chromosome 15, clone RP11-300N24; Homo sapiens chromosome 15 clone RP11-300N24 map 15, LOW-PASS SEQUENCE SAMPLING" EMBL DATABASE ENTRY AC021676; ACCESSION NO. AC021676, 20 January 2000 (2000-01-20), XP002156745	1,4-8, 15,20,26
A	JP 10 286089 A (OTSUKA PHARMACEUT CO LTD) 27 October 1998 (1998-10-27) SEQ ID NO:7	1,4-8, 11,12, 15-20, 26-29
A	TAKEI Y ET AL: "MOLECULAR CLONING OF A NOVEL GENE SIMILAR TO MYELOID ANTIGEN CD33 AND ITS SPECIFIC EXPRESSION IN PLACENTA" CYTOGENETICS AND CELL GENETICS, vol. 78, 1997, pages 295-300, XP002066897 ISSN: 0301-0171 figure 1	1,4-8, 11,12, 15-20, 26-29
A	CORNISH A L ET AL: "CHARACTERIZATION OF SIGLEC-5, A NOVEL GLYCOPROTEIN EXPRESSED ON MYELOID CELLS RELATED TO CD33" BLOOD, vol. 92, no. 6, 15 September 1998 (1998-09-15), pages 2123-2132, XP000913901 ISSN: 0006-4971 figure 2	1,4-8, 11,12, 15-20, 26-29

INTERNATIONAL SEARCH REPORT

International Application No
PC[redacted]S 00/06682

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C07K14/715 C12N15/12 C12N15/63 C12N15/67 C12N5/10
C07K19/00 C12P21/00 A61P3/04 A61K38/17

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C12N C07K C12P A61P A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ, STRAND, BIOSIS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 53840 A (SMITHKLINE BEECHAM CORP.) 3 December 1998 (1998-12-03) SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:258, SEQ ID NO:259	1-29
A	WO 97 20933 A (SCHERING CORP) 12 June 1997 (1997-06-12) SEQ ID NO:5	1-29
T	LONNQVIST F. ET AL.: "Leptin and its potential role in human obesity" JOURNAL OF INTERNAL MEDICINE, vol. 245, no. 6, June 1999 (1999-06), pages 643-652, XP000925953 the whole document	1-29

-/--

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
9 January 2001	19. 1. 01

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Schönwasser, D

10

Form PCT/ISA/210 (second sheet) (July 1992)

Correspondingly, the subject-matter of these claims lacks technical support.

What is claimed is:

1. An isolated hOB-BP2h nucleic acid comprising an hOB-BP2h polynucleotide encoding at least 90-100% of the contiguous amino acids as shown in SEQ ID NO:3.

2. The isolated hOB-BP2 nucleic acid of Claim 1 further comprising at least one mutation corresponding to at least one substitution, insertion or deletion selected from the group consisting of 3P, 4L, 8P, 9L, 11W, 15L, 16Q, 17E, 18K, 19P, 20V, 21Y, 22E, 23L, 24Q, 27K, 30T, 32Q, 37V, 38L, 47W, 48R, 49S, 51Y, 52S, 54P, 56L, 58V, 70A, 71E, 72V, 77N, 78P, 79D, 81R, 83K, 84P, 85E, 87Q, 91R, 93L, 96V, 97Q, 99K, 104S, 106G, 109R, 111E, 113T, 114G, 115S, 124R, 125D, 127K, 129S, 130Y, 131Q, 132Q, 133N, 134K, 135L, 136N, 138E, 141V, 143S, 143I, 144F, 144E, 145T, 210N, and 252A of SEQ ID NO:3.

3. An isolated hOB-BP2h nucleic acid comprising the complementary sequence of the nucleic acid of Claim 1 or Claim 2.

4. A composition comprising at least one isolated nucleic acid according to any of Claims 1-3 and a carrier or diluent.

5. A recombinant vector comprising at least one nucleic acid according to any of Claims 1-3.

6. A host cell comprising at least one recombinant vector according to Claim 5.

X-12652

7. A method for producing at least one hOB-BP2h polypeptide comprising culturing a host cell according to Claim 6 under conditions such that at least one hOB-BP2h polypeptide is expressed in detectable or recoverable amounts.

8. A transgenic or chimeric non-human animal comprising at least one isolated nucleic acid according to any of Claims 1-3.

9. An isolated hOB-BP2h polypeptide comprising at least 90-100% of the contiguous amino acids as shown in SEQ ID NO:3.

10. The polypeptide of Claim 9 further comprising at least one mutation corresponding to at least one substitution, insertion or deletion selected from the group consisting of 3P, 4L, 8P, 9L, 11W, 15L, 16Q, 17E, 18K, 19P, 20V, 21Y, 22E, 23L, 24Q, 27K, 30T, 32Q, 37V, 38L, 47W, 48R, 49S, 51Y, 52S, 54P, 56L, 58V, 70A, 71E, 72V, 77N, 78P, 79D, 81R, 83K, 84P, 85E, 87Q, 91R, 93L, 96V, 97Q, 99K, 104S, 106G, 109R, 111E, 113T, 114G, 115S, 124R, 125D, 127K, 129S, 130Y, 131Q, 132Q, 133N, 134K, 135L, 136N, 138E, 141V, 143S, 143I, 144F, 144E, 145T, 210N, and 252A of SEQ ID NO:3.

11. A composition comprising at least one isolated polypeptide according to Claim 9 or 10 and a carrier or diluent.

12. A method for identifying compounds that bind at least one hOB-BP2h polypeptide according to Claim 9 or 10 comprising:

(a) admixing said polypeptide with at least one test compound or composition; and

(b) detecting at least one binding interaction between said polypeptide and the test compound or composition.

13. An isolated hOB-BP2h nucleic acid molecule comprising a polynucleotide having a nucleotide sequence at least 90% identical to a sequence selected from the group consisting of:

(a) a nucleotide sequence encoding a polypeptide comprising a portion of SEQ ID NO:3, wherein said portion lacks from 30 to 50 amino acids from the amino terminus of said complete amino acid sequence as in SEQ ID NO:3;

(b) a nucleotide sequence encoding a polypeptide comprising a portion of amino acid sequence of SEQ ID NO:3 wherein said portion lacks from 131 to 171 amino acids from the carboxy-terminus of said complete amino acid sequence as in SEQ ID NO:3; and

c) a nucleotide sequence encoding a polypeptide comprising a portion of the amino acid sequence of SEQ ID NO:3 wherein said portion includes a combination of any of the amino terminal and carboxy terminal deletions according to (a) and (b), above.

14. A substantially pure polypeptide comprising an amino acid sequence at least 90% identical to an amino acid sequence selected from the group consisting of:

(a) the amino acid sequence of a full-length polypeptide having the complete amino acid sequence as in SEQ ID NO:3;

X-12652

(b) the amino acid sequence comprising a portion of the complete amino acid sequence as in SEQ ID NO:3 wherein said portion lacks from 30-50 amino acids from the amino terminus of said complete amino acid sequence.

(c) the amino acid sequence comprising a portion of the complete amino acid sequence as in SEQ ID NO:3 wherein said portion lacks from 131-171 amino acids from the carboxy-terminus of said complete amino acid sequence.

(d) the amino acid sequence comprising a portion of the complete amino acid sequence as in SEQ ID NO:3 wherein said portion is the result of a combination of any of the amino-terminal and carboxy-terminal deletions according to (b) and (c), above.

15. A method of treating obesity and diseases and disorders associated with obesity comprising administering to a patient in need thereof an effective amount of the polypeptide according to Claim 13 or 14.

16. A chimeric protein comprising the polypeptide of Claim 13 or 14 fused to a heterologous polypeptide.

17. The chimeric protein of Claim 16 in which the heterologous polypeptide is a constant region of an immunoglobulin.

18. A pharmaceutical formulation containing as an active ingredient the composition of Claim 4 or 11.

19. Method of treating obesity or obesity related diseases by administering a pharmaceutical formulation according to Claim 18.

20. The use of a composition as in Claim 4 or 11 for the manufacture of a medicament for the treatment of obesity and/or obesity-related disorders.

21. A pharmaceutical formulation adapted for the treatment of obesity and/or obesity-related disorders containing a composition as in Claim 4 or 11.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
12 October 2000 (12.10.2000)

PCT

(10) International Publication Number
WO 00/59942 A3

(51) International Patent Classification[7]: C07K 14/715, C12N 15/12, 15/63, 15/67, 5/10, C07K 19/00, C12P 21/00, A61P 3/04, A61K 38/17

(21) International Application Number: PCT/US00/06682

(22) International Filing Date: 22 March 2000 (22.03.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/127,667 2 April 1999 (02.04.1999) US

(71) Applicant *(for all designated States except US)*: **ELI LILLY AND COMPANY** [US/US]; Lilly Corporate Center, Indianapolis, IN 46285 (US).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **SU, Eric, Wen** [CN/US]; 13447 Dunes Drive, Carmel, IN 46032 (US). **WEI, Jian-Jun** [CN/US]; 25 Cinder Road, Oaktree Village #1A, Edison, NJ 08820 (US).

(74) Agents: **PLANT, Thomas, G.** et al.; Lilly Corporate Center, Indianapolis, IN 46285 (US).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— *With international search report.*

(88) Date of publication of the international search report:
5 July 2001

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 00/59942 A3

(54) Title: HUMAN OBESITY PROTEIN BINDING PROTREIN-2 HOMOLOG AND USES THEREOF

(57) Abstract: The present invention relates to at least one novel hOB-BP2h polypeptide, including isolated nucleic acids that encode at least one hOB-BP2h polypeptide, hOB-BP2h polypeptides, vectors, host cells, transgenics, chimerics, and methods of making and using thereof, as well as hOB-BP2h-specific antibodies and methods.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 00/06682

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. [X] Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

Although claims 23 and 27 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.

2. [X] Claims Nos.: 11,19,23(searched incompletely)
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

see FURTHER INFORMATION sheet PCT/ISA/210

3. [ ] Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. [X] As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. [ ] As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. [ ] As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. [ ] No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

[ ] The additional search fees were accompanied by the applicant's protest.

[X] No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-10,12-18,20-29 (partially)

An isolated nucleic acid comprising at least one hOB-BP2h polynucleotide encoding 90-100% of the contiguous amino acid sequence of of SEQ ID NO:3; an isolated nucleic acid comprising a hOB-BP2h polynucleotide comprising a sequence 90-100% of the contiguous nucleotides of SEQ ID NO:1; a composition comprising i.a. said nucleic acid; a recombinant vector comprising said nucleic acid; a host cell comprising said recombinant vector; a method for producing said hOB-BP2h polypeptide; a transgenic or chimeric non-human animal comprising said nucleic acid; an isolated polypeptide comprising a hOB-BP2h polypeptide comprising 90-100% of the contiguous amino acid (aa) sequence of SEQ ID NO:3; an isolated polypeptide comprising at least one polypeptide comprising 90-100% of the contiguous aa of the extracellular domain of SEQ ID NO:3; a composition comprising i.a. one of said polypeptides; an isolated nucleic acid probe, fragment or primer comprising a hOB-BP2h polynucleotide comprising a sequence corresponding or complementary to at least 10 nucleotides of SEQ ID NO:1; an isolated nucleic acid comprisig a nucleic acid that hybridizes under stringent conditions to above nucleic acid; an antibody or fragment thereof that binds an epitope specific to said hOB-BP2h polypeptide; a host cell expressing said antibody; a method for producing an antibody comprising culturing said host cell; a method for identifying compounds that bind an hOB-BP2h polypeptide comprising i.a. the step of admixing said hOB-BP2h polypeptide with a test compound or composition; an isolated nucleic acid molecule comprising a polynucleotide having a nucleotide sequence at least 90% identical to a nucleotide sequence encoding a polypeptide having the complete aa sequence of SEQ ID NO:3 or defined fragments thereof; a polypeptide comprising an amino acid sequence at least 70% identical to the aa sequence of a full-length polypeptide having the aa sequence as in SEQ ID NO:3 or defined fragments thereof; a method of treating obesity by administring said polypeptide; a chimeric protein comprising i.a. above polypeptide; pharmaceutical formulations containing above composition; a method of treating obesity by administring said pharmaceutical formulation and the use of above composition for the manufacture of a medicament for the treatment of obesity.

1.1. Claims: 1-10,12-18,20-29 (partially)
Invention no. 1.1 relates to subject-matter as defined above for "invention 1", with the exception, that invention no. 1.1 refers to the polypeptide sequence SEQ ID NO:4 (and the respective nucleotide sequence SEQ ID NO:2).

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

2. Claims: 1,4-8,12,15-18,20,26-29 (partially)

An isolated nucleic acid comprising at least one hOB-BP2h polynucleotide encoding 90-100% of the contiguous amino acid sequence SEQ ID NO:5; a composition comprising i.a. said nucleic acid; a recombinant vector comprising said nucleic acid; a host cell comprising said recombinant vector; a method for producing said hOB-BP2h polypeptide; a transgenic or chimeric non-human animal comprising said nucleic acid; a composition comprising i.a. one of said polypeptides; an antibody or fragment thereof that binds an epitope specific to said hOB-BP2h polypeptide; a host cell expressing said antibody; a method for producing an antibody comprising culturing said host cell; a method for identifying compounds that bind a hOB-BP2h polypeptide comprising i.a. the step of admixing said hOB-BP2h polypeptide with a test compound or composition; an isolated nucleic acid molecule comprising a polynucleotide having a nucleotide sequence at least 90% identical to a nucleotide sequence encoding a polypeptide having the complete aa sequence of SEQ ID NO:5; pharmaceutical formulations comprising above composition; a method of treating obesity by administring said pharmaceutical formulation and the use of above composition for the manufacture of a medicament for the treatment of obesity.

Please note that all inventions mentioned under item 1, although not necessarily linked by a common inventive concept, could be searched without effort justifying an additional fee.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 11,19,23(searched incompletely)

Present claim 11 relates to isolated polypeptides comprising certain domains (extracellular domain, intracellular domain, transmembrane domain, active domain) of SEQ ID NO:3. The claim covers all isolated polypeptides having this characteristic or property, whereas the application provides support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT for only a very limited number of such isolated polypeptides. In the present case, the claim so lacks support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Independent of the above reasoning, the claim also lacks clarity (Article 6 PCT). An attempt is made to define the isolated polypeptides by reference to a result to be achieved. Again, this lack of clarity in the present case is such as to render a meaningful search over the whole of the claimed scope impossible. Consequently, the search has been carried out for those parts of the claim which appear to be clear, supported and disclosed, namely those parts relating to the extracellular domain of SEQ ID NO:3 as defined on page 60, lines 26 to 31.

Further, present claim 19 relates to an extremely large number of possible compounds or compositions. Support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT is to be found, however, for only a very small proportion of the compounds or compositions claimed. In the present case, the claim so lacks support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Consequently, the search has been carried out for those parts of the claim which appear to be supported and disclosed, namely those parts relating to leptin and antibodies able to bind hOB-BP2h polypeptide as disclosed in the description at pages 6, lines 15 to 22 and page 8, lines 9 to 14, respectively.

Furthermore, claim 23 relates inter alia to a method of treatment by administering an antagonist of the claimed hOB-BP2h polypeptide, without giving a true technical characterization of said antagonist. Moreover, no such antagonists are defined in the application. In consequence the scope of this part of the claim is ambigous and vague and its subject-matter is not sufficiently disclosed and supported. No search can be carried out for this purely speculative part of claim 23, whose wording is in fact a mere recitation of the result to be achieved.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Interr. Application No
PCT/US 00/06682

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9853840 A	03-12-1998	AU 7601698 A	30-12-1998
		EP 0983078 A	08-03-2000
WO 9720933 A	12-06-1997	AU 1406497 A	27-06-1997
JP 10286089 A	27-10-1998	NONE	